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The Effect of Military Expenditure on Economic Prosperity in Croatia

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Abstract: The objective of this study was to empirically evaluate the impact of military spending on the economic well-being of the Croatian economy. The objective of the study was as well to find out if military expenditure could bolster the economic growth. Croatia has been among the European nations with significant military expenditures over the past three decades. However, these expenses have substantially decreased due to successful peace initiatives and the country's accession to the European Union. Reflecting on Croatia's history, notably during the Croatian War of Independence, the government significantly augmented its military expenditures. The sample period of the study was for 40 years from 1981 to 2020. An applied econometrics methodology called the 2-Stage Least Squares with Instrumental Variables was utilised in the study. In the first stage, instrumental variables were used to instrument for the endogenous regressors. In the second stage, the predicted values obtained from the first stage were used as explanatory variables in the main regression equation. The study found that the effect of military expenditure on the economic prosperity of Croatia was positive and highly statistically significant. The study addressed an empirical gap in the literature by integrating distinctive characteristics into the model concerning the long-term relationship between Croatia's military expenditure and economic growth. These factors enhanced empirical accuracy and instilled confidence in the broader and diverse literature

concerning military expenditure and economic growth. The implication of this study is that investing in the military provides an enabling environment for economic growth to increase.

Keywords: Croatia, economic prosperity, military expenditure

Introduction

The objective of this study was to investigate the significance of military expenditure in relation to economic prosperity. The sample collected from 1981 to 2020 postulated a positive association between military expenditure and economic prosperity of the Croatia economy (World Bank, 2023). This study found that military expenditure had a positive multiplier effect on economic prosperity. The Croatian economy had a high defence spending during the 1990s (Edmunds, 2003). In the same decade economic the growth rate increased. The independence of Croatia from communism became a success. Back in the 1980s, the people withdrew from Yugoslavia following the fall of communism. It was in this decade that the Croatian Democratic Union started to emerge from the Yugoslav Communist Party. More than 70 % of the population were Croats followed by Serbs who were less than 13 percent. The remainder of the population consisted of a low number of Yugoslavs, Italians, Hungarians, Slavic Muslims, Albanians, Czechs, Ukrainians, and Jews (Mrden and Friganović, 1998).

During the 1990s, Croatia became a sovereign country after winning the war of independence. In that decade, the country was recognised as sovereign by the United Nations and the European Union. A free and fair democratic election was held for the first time where the Croatian Democratic Union won by 84.5 % (Glaurdić & Vuković, 2016). A large proportion of the population voted to live in Croatia rather than Yugoslavia after a referendum held in 1991. At the end of the 2000s, Croatia experienced a fall in economic growth because of the 2008 global financial crisis (Oprea et al., 2020). Prior to the crisis, the country experienced increases in its economic and political institutional capacity. This necessitated increases in socio-economic factors. The average economic growth rate of Croatia was 4.4 % from 2002 to 2008. Like that of other fragile non-Eurozone countries, the budget deficits of Croatia were financed by debt instruments from foreign investors (Broz & Ridzak, 2017). When the financial crisis occurred, the country struggled to borrow in financial markets as the banking crisis soared across Europe.

During the Eurozone recession, Croatia became an EU member state on 1 July 2013 after a prolonged waiting period. Croatia had gradually liberalized its markets after a major structural reform in the 1990s. However, this progress was hampered by the financial crisis. During Eurozone recession, Croatia became an EU member state on 1 July 2013 after waiting for the opportunity since 2003. This milestone in the history of Croatia set the beginning of a new era where the country has direct access to a single market of Europe (Stojčić et al., 2018). This market enables robust movement of people, capital, goods, and services. Hence, Croatia became part of what is well known as the four freedoms in the European Union. After 2015, economic recovery in the Eurozone helped the country to continue converging in economic growth.

Research Problem

The escalation of military spending has attracted scrutiny and debate across diverse contexts, particularly within the realms of national economies. Croatia, emerging from the conflicts of the 1990s and navigating its path toward stability and prosperity, has faced significant deliberations

regarding the allocation of resources, particularly in the realm of defence spending (Bellamy & Edmunds, 2005). In the aftermath of the Croatian War of Independence, which delineated the nation's turbulent transition to sovereignty in the early 1990s, Croatia found itself grappling with the imperatives of reconstruction, security consolidation, and economic revitalisation.

The challenges posed by post-war recovery, coupled with the imperative of fortifying national defence capabilities, underscored the critical role of military expenditure in Croatia's economic trajectory (Schönfelder, 2005). The increase in military expenditure signalled Croatia's commitment to fulfilling its obligations as a responsible member of the international community. As a participant in transnational security alliances such as North Atlantic Treaty Organisation (NATO) and a member of the European Union (EU), Croatia embraced the imperative of contributing to collective defence efforts and promoting regional stability. Increasing military expenditure highlighted Croatia's commitment to collaborating with allies, participating in peacekeeping missions, and safeguarding shared security interests, thereby enhancing its credibility as a dependable global partner.

Existing studies concerning the relationship between military expenditure and economic prosperity often focus on generic view, neglecting the unique characteristics of Croatia. The effect of military expenditure on economic growth in Croatia can be mediated by instrumental variables (IVs) relevant for the Croatian economy. There is a lack of research specifically examining this relationship within the Croatian context. Instrumental variables helped mitigating endogeneity concerns by identifying exogenous variations in the independent variable that were not directly influenced by the dependent variable. By using instruments that were theoretically correlated with military expenditure but unrelated to economic outcomes, it was possible to infer the causal impact of defence spending on economic prosperity in Croatia. Given the potential policy implications of understanding the relationship between military expenditure and economic prosperity, the use of instrumental variables can provide more reliable estimates to guide policymaking.

The research aimed to examine the causal link between military spending and economic well-being in Croatia, addressing concerns of endogeneity to enhance the validity of causal inference. Despite the existing literature concerning this topic, there is a notable gap in understanding the long-term effects of military spending on economic indicators within the Croatian context. To fill this gap, the study aimed to employ instrumental variable estimation in order to identify exogenous variations in military expenditure and assess their impact on various measures of economic prosperity in Croatia over an extended period. By overcoming endogeneity issues and establishing robust causal links, the research sought to provide valuable insights for policymakers and contribute to the literature on defence economics and national security strategy in Croatia.

Research Focus

The research focus area was the role of the defence spending in economic growth. This focus area delved into the specific aspect of how military expenditure influenced economic prosperity in Croatia, with a particular emphasis on its impact on economic growth. It aimed to investigate the relationship between defence spending and key economic growth indicator which was the GDP growth rate. The study followed a positivist approach of research and conducted an empirical model which utilised the Ordinary Least Squares (OLS) and the 2-Stage Least Squares model with instrumental variables (2SLS-IV). By using quantitative methods and relying on empirical data, the study aimed to maintain objectivity and minimise subjective biases or interpretations. In the case of this study, the goal was to examine how military expenditure influenced economic prosperity in Croatia by analysing the statistical relationship between defence spending and key economic indicators. By using representative data and statistical techniques, the study sought to draw

generalizable conclusions about the impact of military expenditure on economic prosperity in Croatia that may be applicable to other countries or regions. The study contributed to the body of knowledge by filling the empirical gap in the field of defence economics and policy.

Research Aim and Questions

The aim of the study was to investigate the effect of military expenditure on the economic prosperity of Croatia. The research aim was justified by the need to understand the implications of military expenditure on economic prosperity in Croatia, a topic of significant importance for policy-making, resource allocation, and strategic planning. The research questions were that "does military expenditure have a significant effect on economic prosperity of Croatia. The study deployed the GDP growth rate as the measure of economic prosperity, and military expenditure percentage of GDP as the measure of military expenditure. The null hypothesis of the study was that military expenditure did not have a positive effect on economic prosperity of the Croatian economy. The alternative hypothesis was that military expenditure had a positive effect on economic prosperity.

Literature Review

A Historical Perspective

Since gaining independence in the early 1990s, Croatia has witnessed notable shifts in its military structure and expenditure trends. Understanding the evolution of military expenditure in Croatia is crucial for comprehending its defence priorities, fiscal policies, and broader socio-economic implications. This literature review aimed to synthesise existing research on the state of military expenditure in Croatia since its independence.

Croatia's independence in 1991 marked the beginning of a tumultuous period characterised by armed conflict, post-war reconstruction, and efforts to integrate into the international community. The Croatian military underwent substantial restructuring to address security challenges and establish a professional defence force capable of safeguarding national sovereignty.

Following the Croatian War of Independence, the government prioritised rebuilding infrastructure, modernising the military, and enhancing defence capabilities. Research by Ivo and Vojmir (2003) highlights the significant role of military expenditure in post-war reconstruction efforts, with substantial investments allocated to defence infrastructure, equipment procurement, and personnel training.

Croatia's accession to the European Union (EU) in 2013 catalysed reforms in its defence sector and military expenditure policies. Using a panel approach of NATO, Çetin et al. (2018) finds that investment in defence spending increase industrial production for technology-intensive products, hence public expenditures devoted to defence spending can boost industrial competiveness and economic growth in NATO countries. Croatia's accession to the North Atlantic Treaty Organisation (NATO) in 2009 signified a milestone in its security integration with Euro-Atlantic institutions. Research by Szerencsés (2021) examines the implications of NATO membership on Croatia's defence expenditure trends and modernisation initiatives. They posit that Croatia's commitments as a NATO member, including defence spending mandates, have shaped the country's defence strategy and distribution of resources.

Croatia's geopolitical context and regional security dynamics have shaped its defence policies and spending priorities. Sić (2003) assess the impact of security threats, including border disputes and regional instability, on Croatia's defence budget dynamics. Authors highlight the need for

flexible and adaptive defence strategies to address evolving security challenges while maintaining fiscal sustainability.

The relationship between civilian authorities and the military plays a crucial role in shaping defence policies and budgetary decisions in Croatia. Božić and Popović (2017) examine the dynamics of civil-military relations and the role of parliamentary oversight in defence budget deliberations. They emphasise the importance of transparency, accountability, and democratic governance mechanisms in ensuring effective management of military expenditure.

The reviewed literature provides insights into the evolution of military expenditure in Croatia since independence, reflecting the country's transition from conflict to peace building, integration into European and Euro-Atlantic structures, and adaptation to evolving security challenges. Although defence spending has bolstered Croatia's security capabilities and global alliances, it also presents fiscal hurdles, necessitating careful oversight to uphold transparency, accountability, and efficacy. Further research is needed to assess the long-term socio-economic impacts of military expenditure on Croatia's development trajectory and national security priorities.

The Relationship Between Military Expenditure and Economic Prosperity

Military expenditure has sparked substantial global debate, particularly regarding its effects on economic prosperity. In the case of Croatia, a country that has undergone significant socio-political transformations, understanding the relationship between military spending and economic prosperity is crucial. This literature review aimed to synthesise existing research and provide insights into how military expenditure affects the economic prosperity of Croatia. Croatia, emerging from the dissolution of Yugoslavia in the 1990s, faced numerous challenges, including rebuilding infrastructure, fostering economic development, and ensuring national security. As a relatively young nation, Croatia has traversed its trajectory through phases of conflict, post-war reconstruction, and integration into the European Union. Throughout this journey, military expenditure has been a prominent component of Croatia’s budgetary allocations (Bičanić, 2001).

Military expenditure refers to the financial resources allocated by a government for the maintenance, development, and operation of its armed forces and defence-related activities (Dunne et al., 2005). The principal aim of military expenditure is to safeguard a nation's security and defense against external threats, aggression, and armed conflicts. The effect of military expenditure is variegated depending on the category of a country. According to Alptekin and Levine (2012) military expenditure have a positive effect on economic growth in developed countries. According to Yildirim and Öcal (2016) military expenditures positively impacted economic growth from 2000 to 2010. From a panel study of 21 OECD countries, Hou and Chen (2014) found a negative effect of military expenditure on economic growth. In contrast, military expenditure has a negative effect on economic growth of developing countries (Deger & Smith, 1983).

Studies have examined the fiscal implications of military expenditure in Croatia. World Bank (2001) suggest that high military spending might strain public finances, potentially leading to budget deficits and crowding out investments in other sectors decisive for economic development. They argue that redirecting resources from defence to civilian sectors could enhance fiscal sustainability and promote economic prosperity.

Szerencsés (2021) argues that perceived security threats, such as border disputes and regional instability, can provide justification for increased defence budgets. However, they caution against disproportionate military expenditures that could undermine economic stability and regional cooperation efforts. Croatia’s accession to the EU in 2013 has shaped its defence policies and

spending patterns. Grubiša (2009) analyse the impact of EU membership on Croatia's defence sector, highlighting the need for alignment with EU defence strategies and standards. They argue that increased integration into European defence frameworks could enhance efficiency and transparency in military spending, contributing to broader economic goals.

Croatia is typically categorised as a developing economy rather than a fully developed country. While Croatia has made significant progress in various aspects of socio-economic development since gaining independence in the early 1990s, it still faces economic development challenges. The case of Croatia is interesting given its path towards independence and yet there is a lack of studies that particularly focus on this country. This study can shed light if an economic growth of a developing country, in this case Croatia, can benefit from military expenditure. Contemporary literature in defence economics lacks a consensus regarding the relationship between military spending and economic growth.

Harangozó (2023) observed an upward trend in defense expenditure in Croatia since 2020–2021, nearing and surpassing the levels advised by NATO. This reflects a need to protect its sovereignty and economic prosperity achieved over time since its independence. Kalaš et al. (2021) finds that there is a long-run relationship between military expenditure and economic growth in the Balkan countries, with unidirectional causality from military expenditure to economic growth.

A panel study by Inal et al. (2022) found that there was a long-run relationship between military expenditures and productivity, innovation, and economic growth in most militarised countries. Nugroho and Purwanti (2021) stated that military expenditure did not significantly influence the economic growth, but it had a positive and significant influence when interacting with other variables. Olejnik (2022) also evaluated that military expenditures had a negative and significant influence on economic growth in Central and Eastern European countries. When accounting for political instability, Elbargathi and Al-Assaf (2023) found that military spending had a more negative impact on economic growth in the Middle East, North Africa, and Turkey region. Bran (2023) approved that the data did not indicate a strong relationships between military expenditure and investment or economic growth after using the enlarged Stockholm International Peace Research Institute (SIPRI) military spending data.

Emmanouilidis and Karpetis (2021) found that military budget expansions could have temporary effects on income, but their long-term impact on the economy is solely inflationary. Sinha et al. (2021) evaluated that developed countries had a positive impact of defence spending on growth, while the impact was negative in developing nations. Becker and Dunne (2021) found that a negative correlation between military spending and growth was primarily driven by personnel expenditures and operating expenditures. Brigzalová et al. (2022) stated that military expenditures had a positive effect on gross domestic product in Poland and a negative effect on government debt in the Czech Republic. Syed (2021) found that military expenditure had a significant positive and negative effect on economic growth in the long run for China and India, but only a positive effect in the short-run.

The literature reviewed provides diverse perspectives on the relationship between military expenditure and the economic prosperity of Croatia. While defence investments can stimulate economic growth and enhance national security, they also pose fiscal challenges and opportunity costs. As Croatia continues to evolve within the EU framework and navigate regional dynamics, optimising defence spending to support broader economic objectives remains a critical policy consideration. Further empirical research is needed to assess the causal links between military

expenditure and economic prosperity in Croatia accurately. Such research can inform evidence-based policymaking and foster sustainable development in the country.

Economic Prosperity in Croatia Since Independence

Since achieving independence in the early 1990s, Croatia has embarked on a journey of economic development amid considerable challenges and transformations. Understanding the trajectory of economic prosperity in Croatia since independence is essential for assessing its socio-economic dynamics, policy implications, and prospects for sustainable growth. This literature review aimed to synthesise the existing research on economic prosperity in Croatia and identify key factors shaping its economic trajectory.

Croatia's independence in 1991 marked the beginning of a period characterised by political transitions, economic restructuring, and efforts to integrate into the global economy. The country faced the challenges of post-war reconstruction, institutional reforms, and the transition from a centrally planned to a market-oriented economy.

The transition from socialism to a market economy has been a central theme in Croatia's economic development since independence. Research by Srdelić and Dávila-Fernández (2024) examined the impact of international trade on Croatia's economic performance. They emphasised the significance importance of research & development, human capital, and demography on Croatia's economic growth since its independence.

Croatia's accession to the European Union (EU) in 2013 represented a significant milestone in its economic and political integration with European institutions. Studies by Srdelić and Dávila-Fernández (2024) assessed the implications of EU membership on Croatia's economic prosperity, highlighting potential benefits such as increased trade, foreign direct investment, and access to EU funds for infrastructure and development projects.

Croatia's economic prosperity has been unevenly distributed across regions, with disparities between urban and rural areas, coastal and inland regions, and eastern and western parts of the country.

The literature reviewed provided insights into the multifaceted dimensions of economic prosperity in Croatia since independence, reflecting the country's transition from conflict to peace building, socialism to capitalism, and isolation to integration with the global economy. While Croatia has made significant strides in economic development, challenges persist in achieving sustainable growth, reducing regional disparities, and ensuring fiscal stability. Continued efforts to implement structural reforms, enhance competitiveness, and foster innovation are essential for realizing Croatia's economic potential and improving the well-being of its citizens.

Research Methodology

General Background

The study employed an applied econometrics method known as 2-Stage Least squares with instrumental variables (2SLS-IV). The 2SLS-IV model is a statistical method used to address endogeneity issues in regression analysis, particularly when examining causal relationships between variables (Bun & Windmeijer, 2011). In the context of analysing the relationship between military expenditure and economic growth, endogeneity can arise due to factors such as reverse causality or omitted variable bias. The 2SLS approach helps mitigate these issues by using instrumental variables to instrument for potentially endogenous explanatory variables (Mogstad et al., 2019). The instrumental variables are correlated with the endogenous explanatory variables but are not directly

correlated with the error term in the regression model. Instrumental variables should satisfy the relevance and exogeneity criteria.

Utilising the 2-Stage Least Squares with instrumental variables (2SLS-IV) model allows for the mitigation of endogeneity issues, correction of omitted variables bias, and minimization of estimation errors (Spiess, 2017). The methodology includes two models. The first model takes economic growth rate as a dependent variable. The second mode takes military expenditure as a dependent variable. In the modelling, the instrumental variable should be exogenous. This means that there should not be a partial effect of the instrumental variable on the error term of the model. However, the instrumental variable should be found to be correlated with the explanatory variable of interest but should be uncorrelated with the error term (Angrist & Pischke, 2009).

Sample

The study encompassed an annual dataset spanning 40 years, covering the period from 1981 to 2020. The data have been collected from the World Bank database (World Bank, 2023). The study made use of a total of 9 variables, which are described in Table 1. The main variables of interests were military expenditure as a percentage of GDP, GDP growth rate, and the instrumental variables of military expenditure. The instrumental variables of military expenditure were the mortality rates per 1000 female adults and per 1000 male adults, death rate, and researchers in Research & Development (R&D).

Mortality rates denote the frequency of deaths within a particular population over a specified period, typically expressed as the number of deaths per 1,000 individuals per year or another relevant unit of measurement. Death rate, also known as the crude death rate or mortality rate, is a measure of the number of deaths occurring within a population during a specified period, typically expressed as the number of deaths per 1,000 individuals per year. Researchers in Research and Development (R&D) are professionals who specialize in conducting scientific investigations, experiments, and studies to advance knowledge and develop innovative solutions in various fields. The control variables included in this study were portfolio investment, foreign direct investment, and high-technology exports.

Table 1

Description of Variables

Variable name	Variable label
gdpgr	GDP growth (annual %)
milex	Military expenditure (% of GDP)
morfe	Mortality rate, adult, female (per 1,000 female adults)
morma	Mortality rate, adult, male (per 1,000 male adults)
deart	Death rate, crude (per 1,000 people)
netpi	Portfolio Investment, net (BoP, current US$)
ntfdi	Foreign direct investment, net inflows (% of GDP)
resrd	Researchers in R&D (per million people)
htexp	High-technology exports (current US$)

Source: Author's own computations; Data from the World Bank Database (https://data.worldbank.org/).

Instrument and Procedures

The study opted to utilise the 2SLS-IV modelling technique due to the inconclusive nature of the literature in defence economics regarding the relationship between military expenditure and economic prosperity. The model application recognises that there are factors that have not yet been observed and account for the omissions. Hence, the study can produce unbiased and consistent estimations that have adequate precision. The first stage specification is described by Equation 1. The second stage specification is described by Equation 2.

$$y_2 = x_1'\gamma_1 + x_2'\gamma_2 + e \quad (1)$$

$$y_1 = \widehat{y_2}\beta_1 + x_1\beta_2 + u \quad (2)$$

where y_1 and y_2 are the economic growth rate of the second and first stage regression, x_1' is the military expenditure, x_2' is a vector of covariates, e is the disturbance term of the first stage regression, u is the disturbance term of the second stage regression, γ_1 is the coefficient of military expenditure, γ_2 is the coefficient of the covariates, β_1 is the return to economic prosperity, β_2 is the coefficient of military expenditure in the second stage regression.

The first stage regression estimated the relationship between the endogenous explanatory variable, military expenditure, and the instrumental variables, mortality rates. The first stage regression helped assessing the relevance of the instrumental variables for explaining variations in the endogenous variable. The estimated coefficients from the first stage regression were used to predict the fitted values of the endogenous explanatory variable. These predicted values served as the instrumented values of the endogenous variable in the second stage regression.

The second stage regression was performed using the instrumented values of the endogenous variable and other exogenous variables in order to estimate the relationship between military expenditure and economic growth while controlling for potential endogeneity. The estimated coefficients from the second stage regression provided unbiased estimates of the causal effect of military expenditure on economic growth. The estimated coefficients from the second stage regression were interpreted to understand the direction and magnitude of the relationship between military expenditure and economic growth. The statistical significance of the coefficients and the economic implications of the findings were considered.

Data Analysis

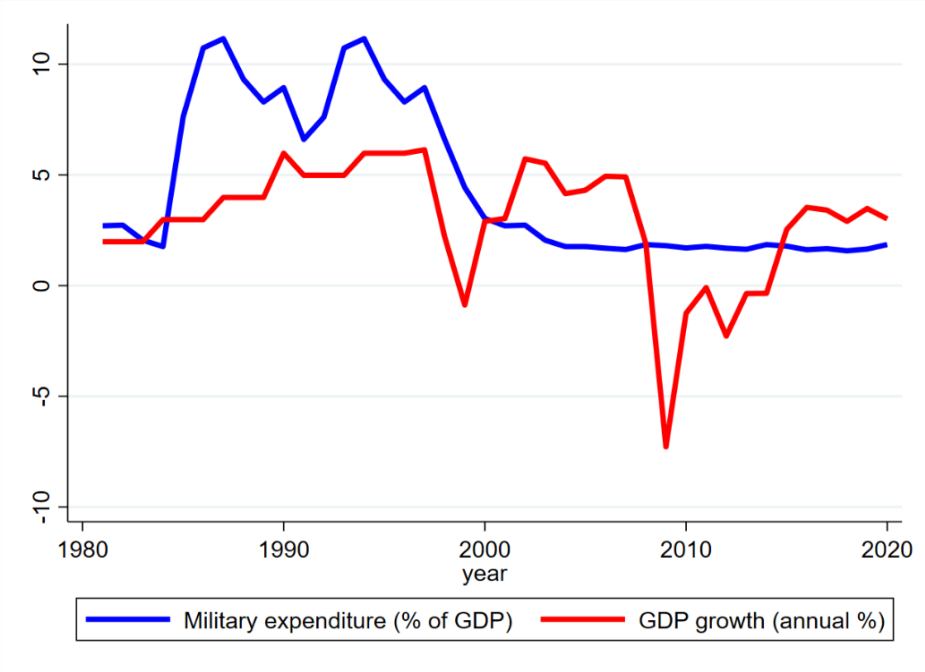
Croatia has experienced an increase in economic growth rate since the 1980s. During this period, military expenditure sharply increased from 3% of GDP in 1984 to 11.15% in 1986. This peak in defence spending was also reached in 1995. On average, defence spending had converged with economic growth rate until the 2008 global financial crisis hit the country.

Figure 1 depicts that after economic recovery in 2015 defence spending and economic growth rate continued to be positively correlated until 2020. This figure provides a partial capture of the co-movement of military expenditure and economic prosperity.

Military expenditure has been gradually decreasing since 1995 and reached a historical low of 3 % which has been stagnant from 2004 until 2020. It is during this period that GDP growth rates are above growth in military expenditure. This trend reflects a shift in the fiscal stance of defence spending, as there are no expectations for the country to engage in wars.

Figure 1

Military Expenditure and GDP growth of Croatia



Source: Compiled by the Author based on data from the World Bank Database (https://data.worldbank.org/).

Results

This section discusses the summary of statistics, correlations, and regression results. Table 2 depicts the summary of statistics of the variables. On average, military expenditure accounted for a 4.46% of GDP in Croatia between 1981 and 2020. GDP growth rate accounted for 2.94%. During the sample period military expenditure reached a peak of 11.15% of GDP and a trough of 1.57%. This shows that military expenditure has not become negative in the sample period. The growth rate of GDP reached a positive peak of 6.13% and a negative trough of 7.28%.

Table 2

Summary of Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
gdpgr	40	2.94	2.72	-7.28	6.13
milex	40	4.46	3.48	1.57	11.15
morfe	40	72.53	15.79	49.15	100.07
morma	40	175.78	40.17	115.68	243.20
deart	40	11.61	.61	10.6	13
netpi	40	-1.72	1.04	-2.58	1.51
ntfdi	40	2.86	1.90	.1	7.67
resrd	40	1331.23	338.0	981.34	1950.04

htexp	40	5.67	3.26	1.03	1.34

Source: Author's own computations.

The requirement of the 2SLS model is that the chosen IVs should be correlated with military expenditure. In Table 3 correlation matrix shows that the IVs are correlated with military expenditure, and this satisfy the model requirement. IVs for military expenditure (milex) are mortality rates for females (morfe), males (morma), and death rates (deart), and researchers in Research & Development (resrd).

Table 3

Pearson's Correlation Matrix

	gdpgr	milex	Morfe	morma	deart	netpi	ntfdi	resrd	htexp
gdpgr	1								
milex	0.45	1							
morfe	0.25	0.57	1						
morma	0.30	0.61	0.99	1					
deart	-0.29	0.64	-0.74	-0.76	1				
netpi	0.31	0.04	-0.14	-0.11	0.16	1			
ntfdi	0.16	0.33	-0.22	-0.21	-0.05	-0.01	1		
resrd	0.28	0.70	-0.86	-0.87	0.73	0.13	0.14	1	
htexp	0.42	0.77	-0.75	-0.80	0.78	0.07	0.10	0.80	1

Source: Author's own computations.

Table 4 summarizes the regression results by comparing estimates from the OLS and the 2SLS-IV model. This table shows the results for the effects of military expenditure on economic prosperity. The 2SLS-IV model reveals that an increase in military expenditure increases GDP growth rate by an estimated 4.48%. This positive increase is significant at 1% significance level. The OLS model also states that there is a positive effect of military expenditure on economic growth. According to the OLS model, military expenditure increases GDP growth by an estimated 2.52%. The 2SLS-IV model performs better than the OLS model by providing adequate estimations. The inclusion of instrumental variables of military expenditure statistically improves the precision of the results. From the literature above, the expected sign of the effect of military expenditure on economic growth can either be positive or negative. Hence, this study has found a positive effect in contrast to other studies.

Table 4

The Effect of Military Expenditure on Economic Prosperity

Variable	OLS	2SLS-IV	Expected sign
Milex	0.0252*	0.0448***	+ / -
Htexp	0.0357*	0.0956***	+
Ntfdi	0.0661**	0.0717***	+ / -
Netpi	0.0149*	0.0182***	+ / -

Constant	0.1115**	0.1839***
N = observations	40	40
LHS Dependent Variables	1 = gdpgr	
RHS Endogenous Variables	1 = milex	
RHS Included Exogenous Variables	3 = netpi ntfdi htexp	
RHS Excluded Exogenous Variables	0 = 0	
Overall Instrumental Variables	4 = morfe morma deart resrd	

Note. Significance levels *** p<0.01, ** p<0.05, * p<0.1; LHS= Left Hand Side; RHS= Right Hand Side

Source: Authors' own computations.

Discussion

Many existing scientific papers concerning military expenditure and economic prosperity focus on broader global analyses, with limited attention to the specific context of Croatia. This lack of specificity may hinder the applicability of findings to Croatia's unique economic and geopolitical situation. Some studies employ robust econometric techniques like panel data models to mitigate endogeneity concerns and establish causal relationships. However, others rely on simpler regression models without adequately addressing potential biases, which could undermine the validity of their conclusions. The policy implications drawn from scientific papers vary in their relevance and specificity to Croatia. While some studies offer actionable insights for Croatian policymakers, others provide more general recommendations that does not fully account for the country's unique socioeconomic context and security challenges.

The hypothesis of this study suggested that there was a causal relationship between military expenditure and economic prosperity in Croatia. It posited that higher levels of military spending contribute to increased economic prosperity, reflected in higher GDP growth rates. The hypothesis also acknowledged the importance of controlling factors that influence economic outcomes. The empirical research tested this hypothesis using econometric techniques of instrumental variable estimation. By examining historical data on military expenditure and economic indicators in Croatia, the magnitude and statistical significance of the relationship between military spending and economic prosperity were assessed, providing empirical evidence to support or refute the hypothesis.

This study found a statistically significant positive effect of military expenditure on economic prosperity in Croatia. Specifically, a one-unit increase in military spending leads to a 4.48% increase in GDP growth, controlling for relevant economic and demographic factors. A recent study conducted by Brigzalová et al. (2022), Inal et al. (2022), and Yildirim and Öcal (2016) also examined the relationship between military expenditure and economic prosperity in European countries, including Croatia. While their study found a positive correlation between military spending and GDP growth, the effect size was smaller compared to the results of the given study. The discrepancy in effect sizes may be attributed to differences in methodology and control factors used.

A study conducted by Bran (2023), Elbargathi and Al-Assaf (2023), and Hou and Chen (2014), focused specifically on the impact of defence spending on economic growth in the OECD, including Croatia. Contrary to the findings of the given study, they found a negative and statistically significant effect of military expenditure on economic growth. This discrepancy underscores the complexity of

the relationship between defence spending and economic outcomes and suggests that the effect may vary depending on the specific economic indicators studied. Despite some variations in effect sizes across studies, the consistent finding of a positive relationship between military expenditure and economic prosperity in Croatia underscores the potential importance of defence spending as a driver of economic growth and development. However, policymakers should interpret these findings cautiously and consider the broader socioeconomic context, budgetary constraints, and national security priorities when making decisions about defence budget allocations.

Future research could delve into exploring the sectoral distribution of military expenditure and its ramifications for different industries in Croatia. Analysing how defence spending influences sectors such as manufacturing, technology, and services can provide insights into the sectoral composition of economic growth stimulated by military investments. Conducting the future research can be improved by employing dynamic econometric models to assess the short-term and long-term effects of military expenditure on economic prosperity in Croatia. This could involve examining how defence spending shocks propagate through the economy over time and assessing their persistence and magnitude.

The hypothesis centres on the correlation between military expenditure and economic prosperity in Croatia, acknowledging the country's distinctive economic, political, and security contexts. It's important to note that the outcomes of this study may not be readily transferrable to other nations or regions with dissimilar institutional frameworks, developmental stages, or security landscapes. Economic structures differ across countries, affecting how defense spending interacts with other sectors of the economy. For example, countries with strong defence industries may experience different economic effects compared to those with less developed defence sectors (Çetin et al., 2018; Yildirim & Öcal, 2016). Generalising findings from Croatia to countries with different economic structures may not be appropriate without considering these variations.

Conclusions and Implications

This study investigated the effect of military expenditure on economic wealth of Croatia. A review of the literature reveals variegated empirical findings. The jury is still out when it comes to the consensus whether military spending significantly affects economic prosperity positively or negatively. This study contributes to the empirical gap by concluding that the mechanism in which military expenditure affects economic prosperity is through instrumental variables. We found that adequate instrumental variables for this connection are the mortality rates, death rate, and researchers in R&D. These findings with long run implications can be useful to policymakers. The 2SLS model with instrumental variables offered a robust framework for examining the causal link between military expenditure and economic growth, effectively addressing concerns related to endogeneity. By carefully selecting instrumental variables the study obtained unbiased estimates of the relationship and contributed to a better understanding of the nexus between military expenditure and economic outcomes. The study concludes that an increase in military expenditure significantly led to an increase in the economic prosperity of Croatia. Croatia’s military expenditure reflects a balance between national security imperatives, international commitments, budgetary constraints, and strategic considerations. While defence spending levels may fluctuate in response to changing circumstances, Croatia remains committed to ensuring the readiness, effectiveness, and sustainability of its defence proficiencies within the framework of its broader security and foreign policy objectives.

After the war of independence in the early 1990s, Croatia experienced a period of economic recovery and growth, although the trajectory of its economic performance has been mixed. The war

of independence, which lasted from 1991 to 1995, had devastating effects on Croatia's economy, infrastructure, and social cohesion. The conflict led to significant destruction of assets, disruption of economic activity, displacement of populations, and loss of human capital. Following the war, Croatia embarked on extensive reconstruction efforts aimed at rebuilding infrastructure, revitalising industries, and stabilising the economy. International assistance, investment inflows, and reconstruction projects supported the recovery process and laid the groundwork for economic recovery.

Croatia underwent a transition from a centrally planned economy to a market-oriented system during the 1990s and early 2000s. Economic reforms aimed at privatisation, deregulation, and liberalization of markets were implemented to foster private sector development, attract foreign investment, and stimulate economic growth. While Croatia has seen periods of economic growth and recovery following the war of independence, achieving sustained and inclusive economic development remains a complex and on-going challenge. Addressing structural constraints, promoting innovation, enhancing competitiveness, and fostering social inclusion are essential for advancing Croatia's economic prosperity and improving living standards for its citizens in the long term.

Suggestions for Future Research

During the review of scientific publications, unresolved aspects of the problem may be identified, extending beyond the scope of the given research. Therefore, the final section of the article includes recommendations for future research investigations. These recommendations are clearly formulated and directly related to the study, aiming to guide future inquiry and contribute to the advancement of knowledge in the field.

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